FORM PTO-1390 (REV 10-95) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. §371

ATTORNEY'S DOCKET NUMBER: F1165(V)

U.S APPLICATION NO. (If known, see 37 CFR §1 5): 09/889664

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/US00/01060	18 JANUARY 2000	21 JANUARY 1999

TITLE OF INVENTION

METHOD OF PREPARING A POWDER MIXTURE

APPLICANT(S) FOR DO/EO/US

LAMBLIN, Claudine, et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ■ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. §371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. §371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. §371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. §371(b) and PCT Articles 22 and 39(1).
4. ■ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ■ A copy of the International Application as filed (35 U.S.C. §371(c)(2))
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ■ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. §371(c)(2)).
7. ■ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. §371(c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ■ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. §371(c)(3)).
9. ■ An oath or declaration of the inventor(s) (35 U.S.C. §371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. §371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 C.F.R. §§1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. §§3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☐ Other items or information:

U.S. APPLICATION NO. (if known, see 37 CFR §1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/889664	PCT/US00/01060	F1165(V)

17. ☒ The following fees are submitted:

BASIC NATIONAL FEE (37 CFR §1.492 (a) (1) - (5)):

		CALCULATIONS PTO USE ONLY
Search Report has been prepared by the EPO or JPO	$860.00	
International preliminary examination fee paid to USPTO (37 CFR §1.482)	$690.00	
No international preliminary examination fee paid to USPTO (37 CFR §1.482) but international search fee paid to USPTO (37 CFR §1.445(a)(2))	$710.00	
Neither international preliminary examination fee (37 CFR §1.482) nor international search fee (37 CFR §1.445(a)(2)) paid to USPTO	$1000.00	
International preliminary examination fee paid to USPTO (37 CFR §1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)	$100.00	

ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 C.F.R. §1.492(e)).		

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	9 - 20 =	0	x $ 18.00	$0.00	
Independent claims	1 - 3 =	0	x $ 80.00	$0.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $ 270.00		

TOTAL OF ABOVE CALCULATIONS =	$860.00	
Reduction of 1/2 for filing by small entity, if applicable. A Verified Small Entity Statement must also be filed (Note 37 C.F.R. §§1.9, 1.27, 1.28).		
SUBTOTAL =	$860.00	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 C.F.R. §1.492(f)).		
TOTAL NATIONAL FEE =	$860.00	
Fee for recording the enclosed assignment (37 C.F.R. §1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. §§3.28, 3.31). $40.00 per property.		
TOTAL FEES ENCLOSED =	$860.00	
	Amount to be refunded:	
	charged:	

a. ☐ A check in the amount of _____ to cover the above fees is enclosed.

b. ■ Please charge my Deposit Account No. 12-1155 in the amount of $860.00 to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ■ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 12-1155. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 C.F.R. §§1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. §1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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UNUS Patent Department
45 River Road
Edgewater, NJ 07020
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Filed: 20 JULY 2001

AJZ:jmm

SIGNATURE

Anthony J. Zelano
REPRESENTATIVE CAPACITY FOR UNILEVER

27,969
REGISTRATION NUMBER

METHOD OF PREPARING A POWDER MIXTURE

The invention relates first of all to a method of preparing a powder mixture for preparing a cake mixture and making a cake, for example a chocolate cake or fruit cake.

Mixtures are known which are composed of a base powder which, for example, may comprise flour, sugar, raising agent (bicarbonate[s] and transformation acid[s]) and aromatic ingredients. In order to prepare the cake mixture the baker has to add to the powder a liquid (water or eggs for example) as well as a fat, before mixing it all, putting it into a tin and into the oven.

A recipe of this kind is not, however, always practical.

Mixtures are also known which are called complete, i.e. comprising the base powder, egg powder and a fat. But in these mixtures, the fat content has a very high melting point, for instance of the order of 50°C. In fact, with a fat having a low melting point, i.e. melting on the tongue, the mixture would lose its pulverulent quality and become pasty, with the result that starch grains of the flour would be coated with paste, preventing their hydration when liquid is poured onto them, and thus would be baked in the oven without being hydrated, which would prevent them rising and would make the cake unintentionally sandy.

However, with such mixtures containing fat with a high melting point, the cakes which are obtained do not have a very satisfactory taste; they leave on the tongue, to use the expression of the person skilled in the art, a "filming" taste.

The applicant thus set itself the problem of preparing a mixture, for the preparation of a cake mixture, including a fat with a low melting point, but which would not make the mixture pasty and which would keep it pulverulent

It is in these conditions that the invention is proposed which is a method of preparing a powder mixture for preparing a cake mixture by pouring on a liquid, the mixture comprising a base powder and a fat with a low melting point, characterised by the fact that

- the fat is introduced into the base powder cold,
- the fat is transformed into pieces and
- the pieces of fat are mixed into the base powder cold.

Thanks to the invention, the fat is preserved in the mixture in a solid state, without being closely connected to the grains of the base powder. These grains are not coated; it is rather they which coat the individualized pieces of fat. This will anyway be the case as long as no mechanical force is applied to the mixture and even if the temperature increases slightly, up to 30°C for example. Before melting or becoming pasty, a fat becomes plastic but remains in the solid state. Butter, for example, remains still relatively hard in the range from 20 to 25°C.

For the preparation of the cake mixture, it will be necessary to add to the mixture for example eggs, by way of liquid, and to beat the mixture. It will then be sufficient to pour the mixture into a tin and to let it bake in an oven to obtain the desired cake.

In the preferred implementation of the method of the invention, the fat is extruded cold to obtain filaments which are introduced into the base powder before being broken into pieces during the mixing.

The invention relates also to an extruder for implementing the preparation method of the invention, characterised by the fact that the conformation and the density, at the surface of the exit extrusion grid, of the extrusion apertures are determined in order to reduce the heating of the fat through the grid.

It has been seen above that the base powder contains at least the following ingredients, moreover in relative proportions which can vary:

- flour,
- sugar,
- raising agent (bicarbonate[s] and its[their] transformation acid[s]),
- aromatic matter.

The transformation acid serves, during the pouring of the liquid, the necessary release of carbon dioxide. The raising agent is a bicarbonate (sodium, potassium, ...) or a mixture of bicarbonates.

As fat, it is possible to envisage both vegetable and animal fats, but preferably butter. In a general manner, fats are considered which have a melting point lower than 37°C, advantageously lower than 32°C, or of which the melting point curve presents a low percentage of solid fraction at a temperature lower than 15°C.

The mixture also contains advantageously an antioxidant, to prevent the fat from going rancid.

By way of example, it will be noted that a mixture has actually been prepared containing

- 31% dark chocolate with 58% cocoa,
- 2% powdered chocolate,
- 24% concentrated butter,
- 32.5888% sugar,
- 10% wheat flour,
- 0.1500% sodium bicarbonate, and 0.2500% pyrophosphate sodium acid (its transformation acid),
- 0.0112% ascorbylpalmitate (antioxidant).

In order, during the preparation and mixing, to keep the low temperature and thus to proceed cold, it is possible to incorporate carbon dioxide snow or liquid nitrogen, making the temperature inside the mixer drop to approximately 5 or 4°C, see below.

The annexed figures make it possible to understand better the implementation of the method of the invention:

- figure I is a simplified view of the installation for preparing the powder mixture, with its extruder and its mixer;
- figure 2 is a plan view of the extrusion grid of the extruder, on a larger scale, and
- figure 3 is a sectional view of the grid of figure 2.

The mixing installation comprises essentially a mixing tank1 and an extruder 2.

The tank 1, here with an axis 4 like a truncated cone, opening out upwards, comprises an endless screw 3 for raising and mixing and a mixing arm 5. The mixing arm 5 extends, in the upper portion of the tank, substantially perpendicular to the axis 4 and here radially between this axis 4 and the wall of the tank 1. During preparation, the arm 5 is driven in rotation around the axis 4. The endless screw extends substantially parallel to the wall of the tank 1, here between a cardan coupling 11 at the base of the tank and the free end 12 of the arm 5.

During preparation, the Screw 3 is driven in rotation around itself and its upper end 13 is driven in a horizontal rotary movement with the free end 12 of the arm 5. The ingredients of the mixture (base powder and pieces of fat) are thus conveyed by the screw in an upward movement during the mixing and, by the screw and the mixing arm, in a horizontal rotary movement. By this double action of upward conveying and gyration, the ingredients are mixed gently and smoothly.

In the upper portion, the mixing tank 1 comprises a cover 6 provided with a hatch 7 for receiving fat, coming from the extruder 2 through a feed hopper 8. The receiving hatch 7 is here off-center for a reason which will become apparent later.

The extruder 2 with its hydraulic pressurization unit 10, is perfectly standard apart from the exit extrusion grid 9, perforated, to a pre-determined density, by specific extrusion apertures 11 making extrusion possible in good conditions, practically without heating the fat.

Thus from a block of butter which is 0°C at its center, filaments of butter are extruded, the temperature of which does not exceed 5°C. In the case in point, the extrusion apertures 11 have a graduated cross-section, here narrowed at the top 12, towards the interior, widened towards the exterior 13, the widened detent section at the exit of the grid, being approximately 5 to 10 times as long as the narrowed section, here 9 times, for a thickness of extrusion grid of 20mm, in its narrowed portion, and of 3mm in its widened portion. As far as the density is concerned, in the internal portion of the grid, apertures, spaced out two by two, in two perpendicular directions, by one aperture diameter, correspond to a satisfactory density with regard to the cross-section of the extruded filaments and the heating of the grid. In other words, the conformation and the density, at the surface of the grid 9 of the extrusion apertures 11 are determined in order to reduce the heating of the fat through the grid.

It will be noted that the plasticity of certain fats could lead to reversing the direction of the extrusion apertures 11, with their narrowed section not at the top but at the bottom.

The extruded filaments enter by the off-centre hatch 7 of the tank. Under the action of arm 5, screw 3 and of the other ingredients being mixed, stirred and raised, the filaments are cut into small pieces. It will be noted, however, that, in order to prevent accumulation of fat filaments on the mixing arm 5 and to safeguard the homogeneity of the mixture, the extrusion process is interrupted cyclically during periods of safeguarding (the homogeneity of the mixture), when the arm 5 arrives opposite the receiving hatch 7, thanks to

which the mixture remains effectively relatively homogenous, without pieces of filament which are too long.

To resume the preparation method, in the mixing tank approximately 800 kg of base powder are prepared after 15 minutes of stirring. Then dry ice, or carbon dioxide snow, is added to lower the temperature of the mixture, then the stirring is carried out for a further 4 minutes approximately, the temperature of the mixture having dropped below 5°C.

Then the block of butter which is O°C is extruded to obtain filaments with a temperature which is also lower than 4°C and the whole is mixed for approximately one minute. It only remains to package the preparation, for example in 480g sachets.

CLAIMS

1. Method of preparing a powder mixture for the preparation of a cake mixture by pouring a liquid, the mixture comprising a base powder and a fat with a low melting point, wherein
   - the fat is introduced into the base powder cold
   - the fat is transformed into pieces and
   - the pieces of fat are mixed into the base powder cold.
2. The method of claim 1 wherein the fat is extruded cold in order to obtain filaments which are introduced into the base powder before being broken into pieces during the mixing.
3. The method of claim 2 wherein the extrusion of fat is interrupted cyclically during periods of safeguarding the homogeneity, of the mixture.
4. The method of claim 1 wherein the ingredients of the mixture are conveyed in an upward movement during the mixing.
5. The method of claim 1, wherein the ingredients of the mixture are carried along in a horizontal rotary movement during the mixing.
6. The method of claim 1 wherein a fat is employed with a melting point lower than 32°.
7. The method of claim 1 wherein a fat is employed, the melting point curve of which presents a low percentage of solid fraction at a temperature lower than 15°C.
8. An extruder for implementing the preparation method of claim 2, comprising an exit extrusion grid, characterised by the fact that the conformation and

the density, at the surface of the grid reduce the heating of the fat through the grid.

9. The extruder of claim 8 wherein the extrusion apertures have a graduated cross-section with a detent portion with an enlarged section at the exit of the grid.

10. The extruder of claim 8 wherein the extrusion apertures, in the inside portion of the grid, are spaced out two by two, in two perpendicular directions, by one aperture diameter.

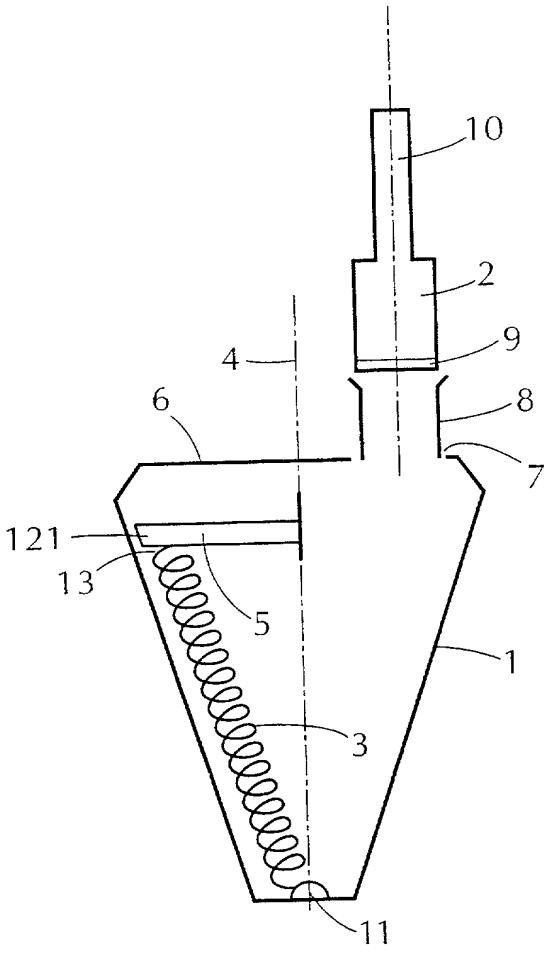

FIG. 1

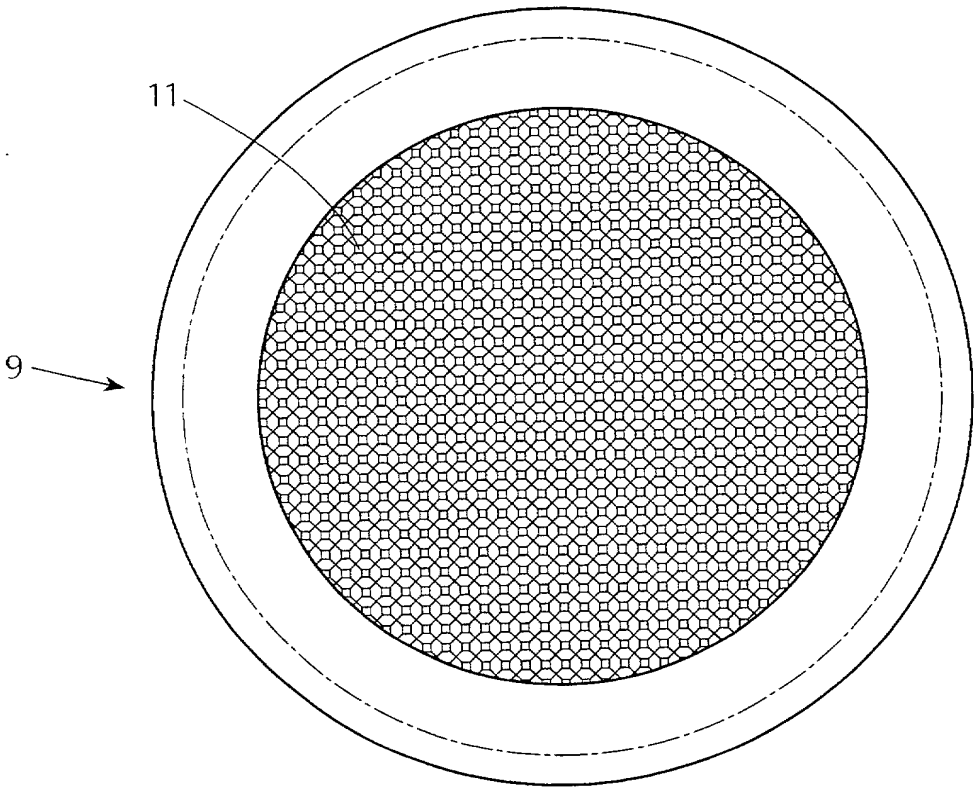

FIG. 2

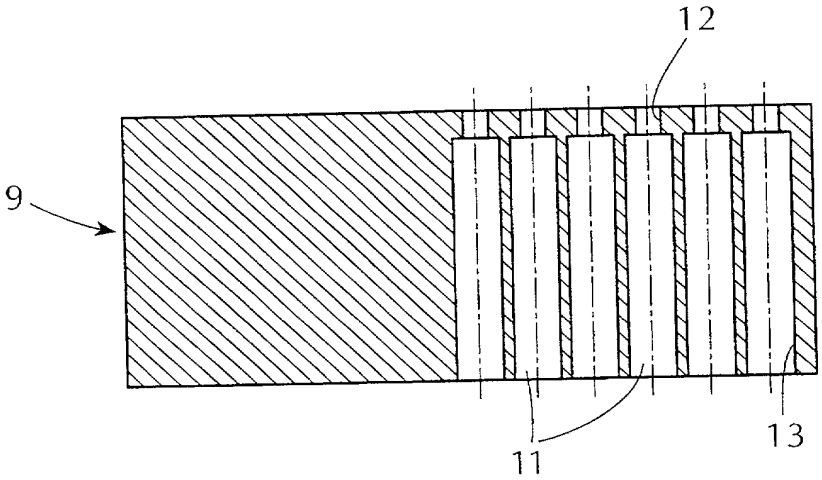

FIG. 3

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (Includes Reference to PCT International Applications)	Attorney Docket No. F 1165 (V)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD OF PREPARING A POWDER MIXTURE

the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application Serial No. 09/ _____ on and was amended on _____ (if applicable)

☒ was filed as PCT international application PCT/US00/01060 on 18 January 2000 and was amended under PCT Article 34 on 24 August 2000(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. 119
France	99/00625	21 January 1999	YES

I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code §112. I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application.

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120.

U.S. APPLICATIONS		STATUS (CHECK ONE)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED

PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S SERIAL NUMBERS ASSIGNED (if any)		
PCT/US00/01060	18 January 2000			

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (Includes Reference to PCT International Applications)	Case No. F 1165 (V)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agents(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

CUSTOMER NUMBER: 000201

Direct all correspondence to: CUSTOMER NUMBER 000201

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FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
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POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
Claudine LAMBLIN	René Le Flécher	
DATE 11 July 2001	DATE 27th July 2001	DATE